

Priapism

Priapism is defined as a persistent unwanted penile erection. Typically only the corpora cavernosa are involved. There are two main types: ischaemic (veno-occlusive, low-flow) and non-ischaemic (arterial, high-flow). Ischaemic priapism describes a compartment syndrome of the penis resulting from a failure of detumescence, leading to ischaemia and ultimately fibrosis. Hypoxia, acidosis and glucopenia cause impaired smooth muscle contraction – irreversible at 4 hours, thrombosis and fibrosis at 12 hours, necrosis after 24 hours. The condition is idiopathic in over half of all patients; the remainder are associated with diseases (eg. sickle cell, leukaemia, spinal cord tumour, malignancy) drugs (eg. antipsychotics, anticoagulants, antidepressants) and intracavernosal therapy for erectile dysfunction. Patients usually present late with a painful erection and often a history of an antecedent cause or recurrent episodes. Examination reveals hard corpora cavernosa with a soft glans penis, indicating non-involvement of the corpus spongiosum. Non-ischaemic priapism is secondary to penile or perineal trauma and results when injury creates an arterial-sinusoidal shunt within the corpus cavernosum. The erection also involves only the corpora cavernosum with sparing of the corpus spongiosum, but is softer than is seen with ischaemic cases and is characteristically painless. Because the corpora are filled with oxygenated blood, no compartment syndrome exists, and thus non-ischaemic priapism is not considered an emergency.

Whilst it is usually relatively straightforward to distinguish between the two types of priapism on history and examination alone, occasionally difficulties arise, and it is for this reason that blood gas determination of corporeal blood is considered mandatory in all patients. Corporeal aspiration is performed by inserting a 19 gauge butterfly needle into the lateral edge of one corpus cavernosum (two needles are unnecessary as the septum between each corporeal body is incomplete) and aspirating blood for analysis. A PO_2 less than 30 mmHg or any degree of acidosis requires immediate attempts at detumescence. Conservative measures such as ice-packs, physical exertion, and masturbation occasionally have been advocated in the past but are generally ineffective. Therapeutic aspiration is considered to be the first manoeuvre following diagnostic aspiration, achieving detumescence in approximately 30% of cases. Typically 10-15 ml of blood is aspirated and replaced with an equal volume of normal saline. The procedure is repeated until the aspirate is bright red. The next step if therapeutic aspiration fails is direct corporeal administration of a sympathomimetic agent. Although a number of vasoactive agents have been used, phenylephrine, a selective alpha-1 adrenergic agonist, has the best cardiovascular side-effect profile, and is thus recommended. It can be expected to induce resolution in 65% of cases. 10 mg (concentration 10mg/ml) of phenylephrine is diluted in 99ml normal saline to a concentration of 100 mcg/ml. Under strict pulse and blood pressure monitoring 3-5 ml of solution is injected into the corpora every 5 mins for up to one hour before declaring treatment failure. For refractory cases prompt surgical intervention is required to establish a shunt between the erect corpora cavernosa and either the glans penis [Winter (venflon), Ebbehøj (scalpel-blade) or Al-Ghorab (excision of disc of corpus cavernosum tip) techniques], corpus spongiosum (Quackels) or saphenous vein (Grayhack

procedure). Shunt procedures have combined resolution rates of 66-77%; more proximal procedures are associated with the highest resolution rates but increased complications, particularly erectile dysfunction. Indeed erectile dysfunction is a major complication of prolonged priapism: 90% of men with a priapism lasting more than 24 hours do not regain the ability to have intercourse. It is for this reason that immediate penile prosthesis insertion, initially with a temporary malleable prosthesis, is often considered for failed shunting and late presentation (>24 hours) of priapism. In this latter respect recent studies from London suggest that MRI scan has a 100% sensitivity and specificity for cavernosal fibrosis, which may be used in the future to determine whether there is any value for shunting.

Table 2 – Typical Blood Gas Values			
Source	P _O ₂ (mm Hg)	P _{CO} ₂ (mm Hg)	pH
Ischemic priapism (cavernous blood) ³	<30	>60	<7.25
Normal arterial blood (room air)	>90	<40	7.40
Normal mixed venous blood (room air)	40	50	7.35

30 mmHg = 4 KPa 60 mmHg = 8KPa